

# Work Order ID 65576

January 20, 2011 9:14:24 AM



Page 1

Item ID: D212-664-101

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Fwd

Start Date: 1/20/11 Start Qty: 1.00



Cust Item ID:

Required Date: 2/07/11 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan: CL

Date: 11/01/20 Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D212-664-141

Rev D

100.

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D212-664-101 CHG003

*8 uloz/24*

*for BG 11-02-24*

110

0.00



Pick Kit

Packaging

Memo

0.00

Packaging

Packaging

*11-2-10*

120

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D212-664-141 using CNC bender program 212-fw and Folio D212-664-101

*11-2-10*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & Initial all entries

# Work Order ID 65576

January 20, 2011 9:14:24 AM



Page 2

Item ID: D212-664-101

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Fwd

Start Date: 1/20/11 Start Qty: 1.00



Cust Item ID:

Required Date: 2/07/11 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130  QC Quality Control	QC15- Crosstube Dimensional Check  Memo	0.00 0.00							
140  Crosstubes Crosstubes	Crosstubes  Memo 1-Drill pilot holes in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549,using drill table DT8577,set-up towers in hole #7 as per QSI 10  2-Ream hole to finish size in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549.Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.  3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-141  4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-141	0.00 0.00							 

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & Initial all entries

**Work Order ID 65576**

January 20, 2011 9:14:24 AM



Page 3

Item ID: D212-664-101

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Fwd

Start Date: 1/20/11 Start Qty: 1.00



Cust Item ID:

Required Date: 2/07/11 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

150



HandFXtube

Crosstubes Chemical Conversion

0.00

Memo

0.00

Hand Finishing Crosstubes

Chemical Conversion Coat within 24 hours of bending and drilling

B  
11/02/14

160



QC

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

Quality Control

Sub 16

tD

170



Outsource2

Outsource process - NDT per QSI038 4.1

0.00

Memo

0.00

Outsource process - NDT

Liquid Penetrant Inspection as per QSI 038  
Issue P/O: 13517  
LPI as per ASTM 1417 Level 2  
Attach copy of NDT results to work order

CY 11/02/17 ①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

**Work Order ID 65576**

January 20, 2011 9:14:24 AM



Page 4

Item ID: D212-664-101

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Fwd

Start Date: 1/20/11 Start Qty: 1.00



Cust Item ID:

Required Date: 2/07/11 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

180

Receive & Inspect for Damage & Mat'l Certs  
Packaging

0.00

Packaging

Memo

0.00

Packaging

Ensure copy of NDT results attached to work order.

190



QC5- Inspect part completeness to step on W/O

0.00

QC

Memo

0.00

Quality Control

Inspect for damage &amp; ensure results are as per Dwg D212-664-141

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



**Work Order ID 65576**

January 20, 2011 9:14:24 AM



Page 5

Item ID: D212-664-101

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Fwd

Start Date: 1/20/11 Start Qty: 1.00



Cust Item ID:

Required Date: 2/07/11 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

200

Spray Painting per QSI005 4.2

0.00



SprayPaint

SprayPaint

Memo

0.00

Spray Painting

1-Prime inside and outside crosstube as per QSI 005 4.2  
2-Paint outside crosstube with White Imron as per QSI 005 4.2

PRIME:

Start Time: 10:00

Finish Time: 11:00

PAINT:

Start Time: 3:00

Finish Time: 4:00

35 11-02-23

210

QC14- Inspect Spray Paint

0.00



QC

Memo

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

11 02 23 ①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

**Work Order ID 65576**

January 20, 2011 9:14:24 AM

Page 6

Item ID: D212-664-101

Accept

Setup Start

Revision ID:

Stop

Item Name: Crosstube Fwd

Start Date: 1/20/11 Start Qty: 1.00

Cust Item ID:

Required Date: 2/07/11 Req'd Qty: 1.00

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

220

0.00



Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe  
2- Install supports with magnobond as per QSI 015 Adhere for 12 Hrs  
A/R 6398 Magnobond Batch: 116227  
3- Torque bolts as per dwg

PT 11-02-23

230

0.00



QC

Quality Control

QC6- Inspect dimensions to drawing

Memo

0.00

8/16/24(H)

240

0.00



Packaging

Packaging

Pick Kit

Memo

0.00

11/2/24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

# Work Order ID 65576

January 20, 2011 9:14:24 AM



Page 7

Item ID: D212-664-101

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Fwd

Start Date: 1/20/11 Start Qty: 1.00



Cust Item ID:

Required Date: 2/07/11 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

250 QC4- 100% Inspect kits for completeness

0.00



QC

Memo

0.00

Quality Control

*Eluozky*

*(+U)*

260

0.00



Packaging

Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D212-664-101

*Loc 103*

*New R*

*11/02/24*

270

0.00



QC

QC21- Final Inspection - Work Order Release

Memo

0.00

Quality Control

*11/02/24*

*mf*

*11-02-24*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

# Picklist Print

January 20, 2011 9:14:24 AM

Page 1

Work Order ID: 65576

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd



Start Date: 1/20/11

Required Date: 2/07/11

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:E 04.02.16 Reformat KJ/DS  
 IPP Rev:F 06-03-29 Remove Coments on Pick List JLM  
 IPP Rev:G 07-04-30 As per Rev C JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D212-664-101TRN		Manufactured	No			110	Each	1.0000	1	1			
-----------------	--	--------------	----	--	--	-----	------	--------	---	---	--	--	--



Crosstube Turning Detail

Location	Loc Qty	Loc Code
LG	1	
B65764	1	
63696		

D3595-063-450		Manufactured	No			230	Each	61.3390	4	4.210526			
---------------	--	--------------	----	--	--	-----	------	---------	---	----------	--	--	--



RUBBER CUSHION

Location	Loc Qty	Loc Code
LG	28.33897368	
53775	5.97897368	
58161	3.56	
59580	0.12	
61465	4.68	
63960	14	
ST415	33	
64171	32	
64300	1	

DP 11-2-8  
 ST 11-02-23

x4

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



# Picklist Print

January 20, 2011 9:14:24 AM

Page 2

Work Order ID: 65576

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd

Start Date: 1/20/11

Required Date: 2/07/11

Start Qty: 1.00

Required Qty: 1.00

MS21920-25

Purchased No

220 Each

123.0000

4

4



Clamp(per MIL-DTL-8783C)



ET 11-02-23

Location	Loc Qty	Loc Code
LG	99	
113281	0	
114759	5	
114901	3	
115278	1	
115849	40	x4
116264	50	
ST451	24	
113281	5	
113282	18	
113744	1	

D2893-1

Manufactured No

220 Each

13.0000

2

2



2.75 Support



ET 11-02-23

Location	Loc Qty	Loc Code
LG	13	
59457	3	
63367	10	x2

D3428-1

Manufactured No

240 Each

13.0000

1

1



Placard



11/2/24 SP

Location	Loc Qty	Loc Code
ST056	13	
63978	13	

January 20, 2011 9:14:24 AM

Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

# Picklist Print

Page 3

January 20, 2011 9:14:24 AM

Work Order ID: 65576

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd

Start Date: 1/20/11

Required Date: 2/07/11

Start Qty: 1.00

Required Qty: 1.00

AN6-35A

Purchased

No

240

Each

97.0000

4

4



BOLT



11/2/24 SP

Location

Loc Qty

Loc Code

ST343

97

115698

7

115742

40

116528

50

4

AN6-36A

Purchased

No

240

Each

76.0000

4

4



Bolt



11/2/24 SP

Location

Loc Qty

Loc Code

ST343

76

115698

30

115835

26

116400

20

4

MS21042L6

Purchased

No

240

Each

310.0000

6

6



Nut



11/2/24 SP

Location

Loc Qty

Loc Code

ST300

310

111578

4

114495

1

115300

55

116102

50

116373

100

116548

100

6

AN960JD616

NAS1149D0663J

Purchased

No

240

Each

0.0000

18

18



Washer



11/5/98 11/2/24 SP

January 20, 2011 9:14:24 AM

Shop Packet Print

Page 3

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

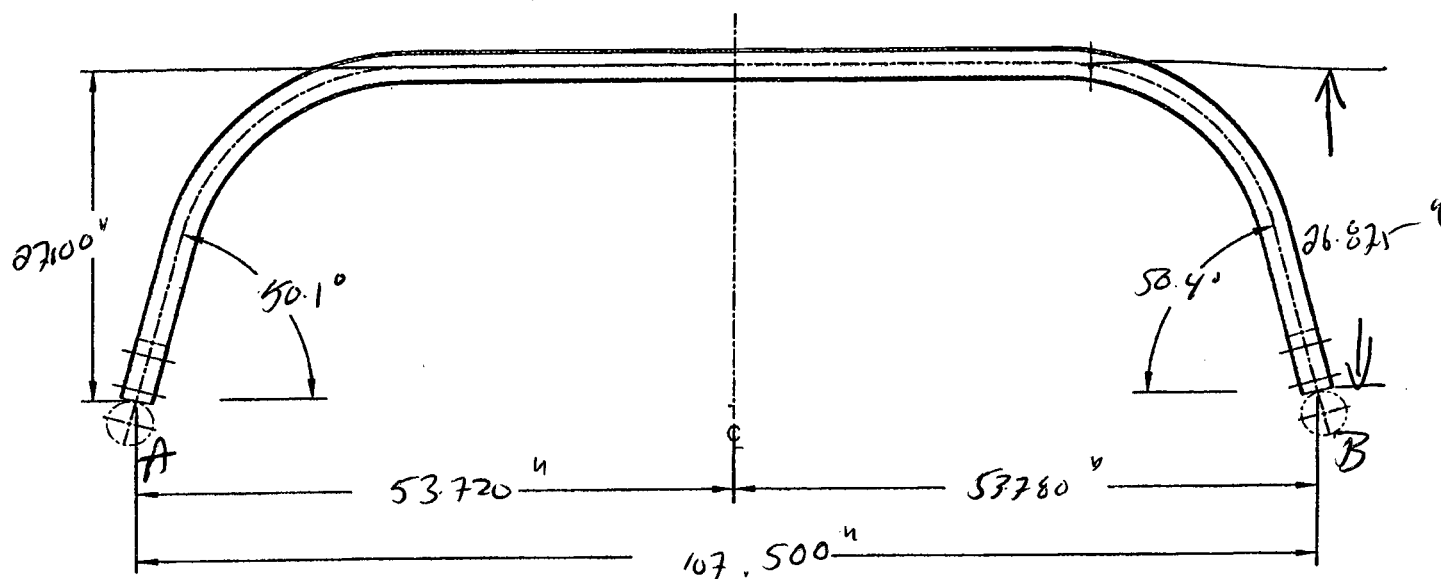
Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

DART AEROSPACE LTD		Work Order:	65576
Description: Crosstube High Fwd (205/212/412)		Part Number:	D212-664-101
Inspection Dwg: D212-664-141 Rev: D		Page 1 of 1	

Required Dimension	Min	Max
Height	26.79	27.05
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.7



Comments

QC15 Inspection	8
Date	11/02/10

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.31	Dimensions updated per Dwg Rev C	KJ/JM	
C	10.04.01	Dwg Rev updated	KJ	



8 7 6 5 4 3 2 1



Item	Qty -141	Qty -141B	Part Number	Description
1	X		D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
2		X	D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)
3	1	1	D6005-128	CROSSTUBE
4	2	2	D2893-1	SUPPORT
5	4	4	D3595-063-450	RUBBER CUSHION
6	4	4	MS21920-25	CLAMP (OR MS21920-26)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 65576  
CZ11101120

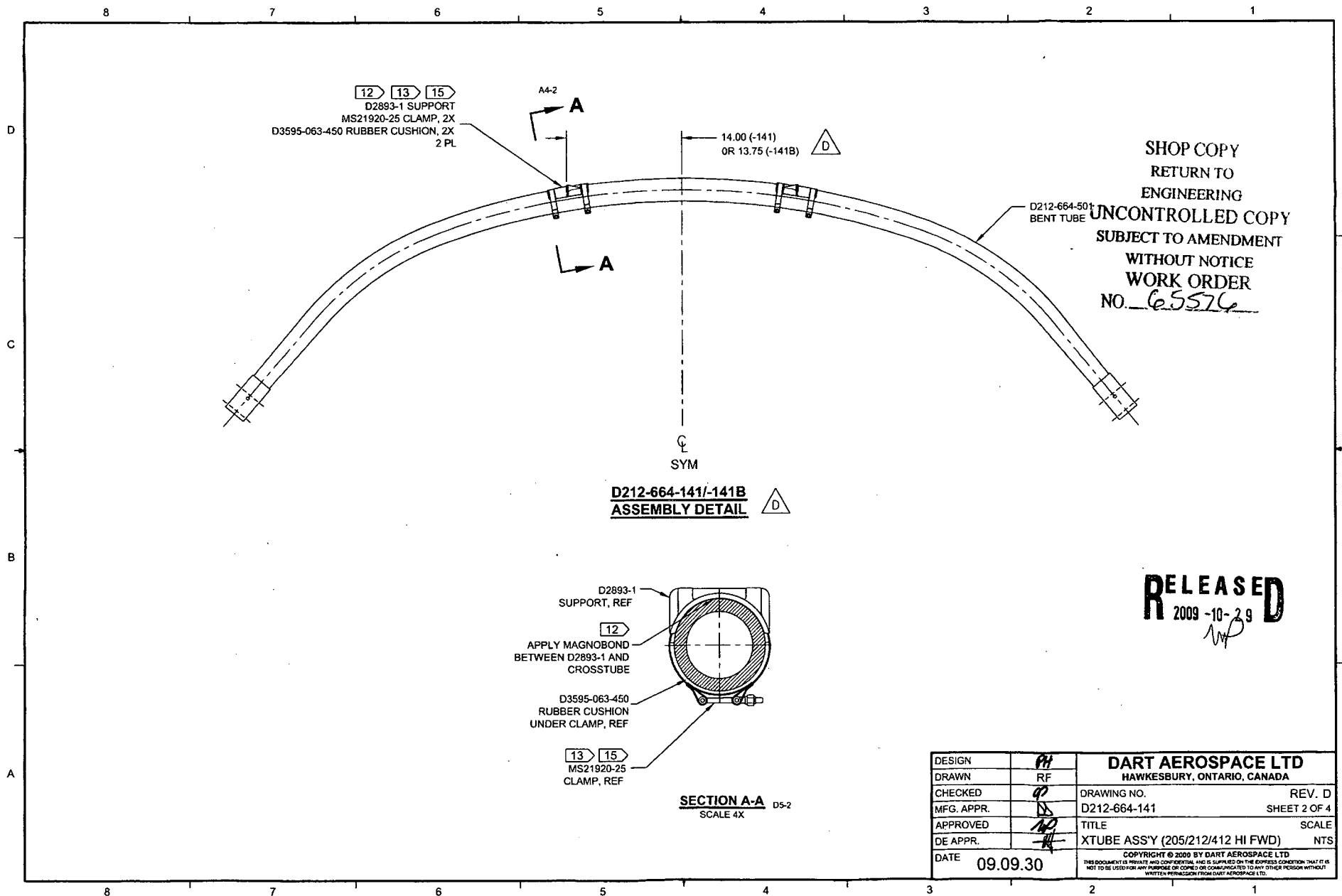
#### GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6005-128  
FINISHED LENGTH = 126.514±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 016 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF  
USING VIBRATING STYLUS
- 7) WEIGHT: D212-664-141 = 33.6 lbs (PER IIN-D212-664)  
D212-664-141B = 33.6 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS  
6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF  
D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER  
INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1  
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE  
SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE  
SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR  
DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND  
MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT  
HAS NOT BOTTOMED-OUT AFTER TORQUING.

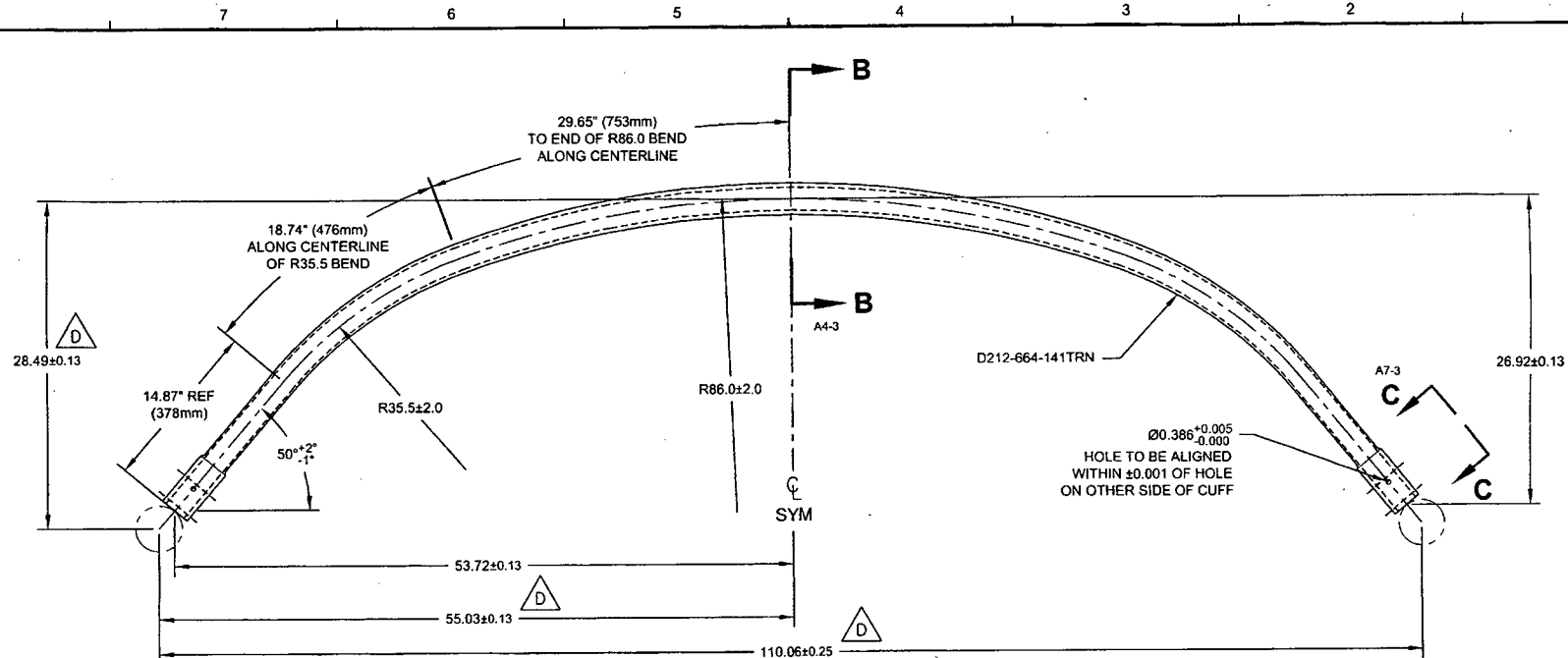
RELEASED  
2009-10-29  
MM

D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS: ADD -141B (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, C6-3, C8-3 & B6-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	PH	DRAWING NO.	REV. D
MFG. APPR.	PH	D212-664-141	SHEET 1 OF 4
APPROVED	PH	TITLE	SCALE
DE APPR.	PH	XTUBE ASSY (205/212/412 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

8 7 6 5 4 3 2 1





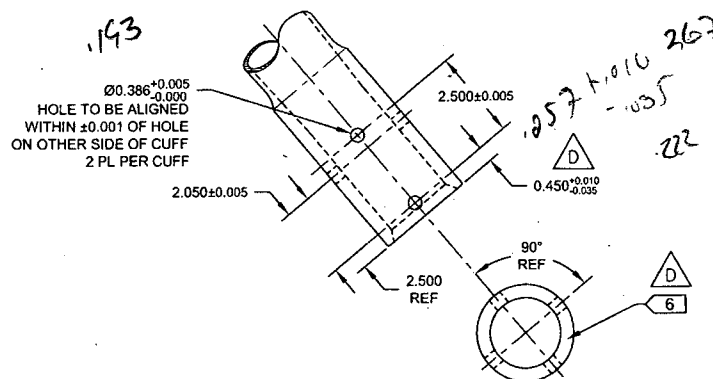


**D212-664-501**  
**BENDING AND DRILLING DETAIL**

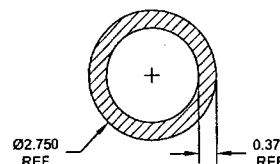


SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 65576

**RELEASED**  
2009-10-29



**VIEW C-C: CUFF DETAIL** C2-3  
SCALE 3X



**SECTION B-B** C4-3  
SCALE 4X

DESIGN	PH	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	Q	DRAWING NO. D212-664-141	REV. D
MFG. APPR.	IS	SHEET 3 OF 4	
APPROVED	AP	TITLE	SCALE
DE APPR.	ST	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
DATE	09.09.30	<small>           COPYRIGHT © 2000 BY DART AEROSPACE LTD            THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL. IT IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS            NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT            WRITTEN PERMISSION FROM DART AEROSPACE LTD.         </small>	





# LIQUID PENETRANT TEST REPORT

P- 15202

PAGE 1 OF 1

CLIENT

DALT Aerospace

DATE

FEB. 17, 2011

TIME

AM ☒ PM ☐

ATTENTION

Linda L. L. L.

ACUREN JOB NO.

100-11-2038

ADDRESS

1270 ABEL DEEN ST  
HAWKES BURY, ON.

POWOW NO.

13517

WORK LOCATION

HAWKES BURY

PROJECT

F. P. I.

ACCEPTANCE STD.

ASTM 1417/651-C6 REV./DATE 2005

ITEM(S) EXAMINED

8

JOB DESCRIPTION

PROCEDURE NO. LT-2002 REV./DATE 2008

TECHNIQUE NO. LT-1342 REV./DATE 2008

PART NO.

MATERIAL ALUMINUM THICKNESS VARIOUS

SCOPE

WET FLUORESCENT LIQUID PENETRANT INSPECTION  
CALIBRES CUT ON 100% EXTERNAL.

TEST DETAILS

METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED
FAMILY BRAND	MAGNA FLUX		BLACK LIGHT S/N	16459	<input checked="" type="checkbox"/> OUTPUT > 1000 $\mu$ W/cm <sup>2</sup>
PENETRANT	2L 67	MINIMUM DWELL TIME	45	MIN.	<input type="checkbox"/> AMBIENT < 2 fc
PENETRANT REMOVER	H2O	MINIMUM DRY TIME	>10	MIN.	<input type="checkbox"/> OUTPUT > 100 fc @ SURFACE
DEVELOPER	SKD 52	MINIMUM DWELL TIME	10	MIN.	OTHER LAB. NO.
DEVELOPER TYPE	<input checked="" type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY	LIGHT METER S/N	1098866
				CAL DUE DATE	CUT 15-2011

TEST SURFACE

SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < -4°C/20°F	<input type="checkbox"/> -4°C/20°F TO 10°C/50°F	<input type="checkbox"/> 10°C/50°F TO 52°C/125°F	<input type="checkbox"/> > 52°C/125°F	

RESULTS-

(☐ METRIC ☐ IMPERIAL)

- |   |                         |   |
|---|-------------------------|---|
| 1 | CROSS TUBE - W.O. 65318 | ✓ |
| 1 | CROSS TUBE - W.O. 65319 | ✓ |
| 1 | CROSS TUBE - W.O. 65577 | ✓ |
| 1 | CROSS TUBE - W.O. 65576 | ✓ |
| 1 | CROSS TUBE - W.O. 65308 | ✓ |
| 1 | CROSS TUBE - W.O. 65307 | ✓ |
| 1 | CROSS TUBE - W.O. 66021 | ✓ |
| 1 | CROSS TUBE - W.O. 66020 | ✓ |

11-02-12

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE

Ran Titley

PRINT

SIGNATURE

DTR # E63243

TECHNICIAN (SIGNATURE):

U. L. Houston

1<sup>st</sup> TECHNICIAN

2<sup>nd</sup> TECHNICIAN

NAME (PRINT):

CGSB LEVEL II SNT LEVEL

CGSB REG. NO. 66606

CGSB LEVEL SNT LEVEL

CGSB REG. NO.

REPORT

REVIEWED BY:

NAME

INITIALS